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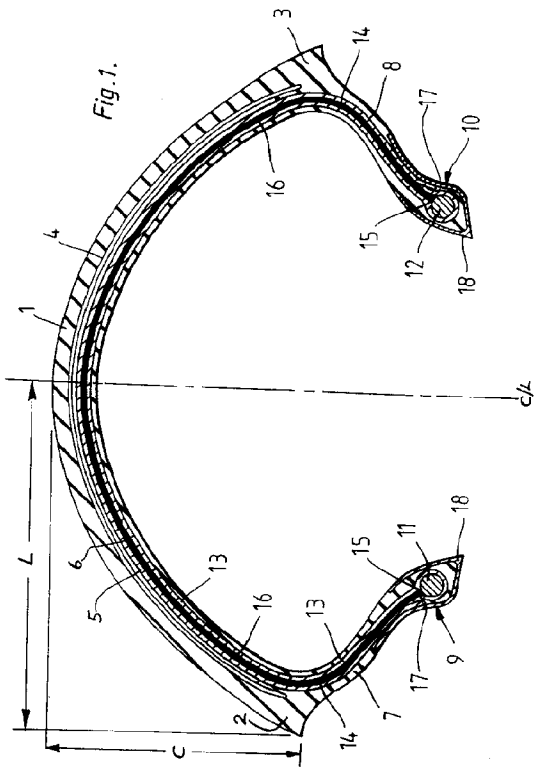
(54) Motorcycle radial tyre

(57) A motorcycle tyre comprising a tread (1) reinforced between its edges (2,3) by a breaker assembly (4) and having in its normally inflated fitted condition a camber value C/L of between 0.5 and 0.7, a reinforcing carcass ply (13) of rubber covered cords radially inside the breaker assembly and extending between two bead regions (9,10) and wrapped in each bead region around an annular bead core (11,12) to form carcass ply turn-ups (17) and between the tread edges (2,3) and bead regions (9,10), tyre sidewalls (7,8) characterised in that under the tread (1) is disposed radially inward of the breaker assembly (4) a secondary carcass ply (5) of rubber covered cords and between the carcass ply (13) and the secondary carcass ply (5) is disposed a rubber member (6) extending from tread edge (2,3) to tread edge (2,3).

Fig.1.



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Description

This invention relates to motorcycle tyres and in particular but not exclusively to high performance or race motorcycle tyres.

Such tyres utilise very wide treads which in transverse cross-section are sharply curved to provide good contact with the road surface when the motorcycle is steeply banked in cornering. Maintenance of a consistent ground contact area of 'tyre footprint' under all conditions is a major problem in determining general vehicle handling. Of particular importance in race motorcycle tyres is the provision of high cornering power with the good stability to maximise cornering speeds under race conditions and the maintenance of tyre shape and footprint under conditions of heavy braking.

Present motorcycle race tyres have short sidewalls which extend to the tread edges radially and axially outwardly from the tyre beads. The beads provide engagement to the wheelrim on tapered bead seats. The sidewalls are reinforced by a carcass ply or plies which when tensioned by the inflation pressure act together with sidewall geometry to provide location of the curved tread regions to withstand cornering forces.

The sharply curved tread region of the tyre is specially reinforced by a reinforcing breaker to give the required structural rigidity to allow for banking over of the motorcycle when cornering whilst giving sufficient flexibility to allow localised tread flattening in the ground contact patch for good road grip.

Our co-pending UK Patent Application No 9403230.7 describes a radial motorcycle tyre in which the tread region is further reinforced by a sub-breaker ply comprising nylon reinforced material positioned radially between the carcass ply and the breaker. Whilst this construction has been found to improve cornering power and grip it has been found not fully effective in preventing tyre collapse under severe braking.

An object of the present invention is to improve the braking properties of such motorcycle tyres.

According to one aspect of the present invention a motorcycle tyre comprises a tread reinforced between its edges by a breaker assembly and having in its normally inflated fitted condition a camber value C/L of between 0.5 and 0.7, a reinforcing carcass ply of rubber covered cords radially inside the breaker assembly and extending between two bead regions and wrapped in each bead region around an annular bead core to form carcass ply turn-ups and between the tread edges and bead regions, tyre sidewalls characterised in that under the tread is disposed radially inward of the breaker assembly a secondary carcass ply of rubber covered cords and between the carcass ply and the secondary carcass ply is disposed a rubber member extending from tread edge to tread edge.

By camber value is meant the ratio C/L between the radial distance C from the centre to the edge of the tyre tread and the axial distance L between the centre and edge of the tread.

Preferably the rubber member and the secondary carcass ply extend through the sidewalls into the bead regions.

Also preferably the cords in the carcass and secondary carcass plies are organic fibre cords such as nylon cords and are inclined at an angle of between 50° and 90° to the tyre circumferential direction Also preferably they are crossed with respect to each other.

Preferably the rubber member has a hardness in the range of 55-75 Shore A measured at 21°C and a constant thickness in the range 0.4 to 1.6mm.

Further aspects of the present invention will become apparent from the description of the following embodiments in conjunction with the attached diagrammatic drawing in which:-

Figure 1 shows in cross-section a motorcycle tyre intended for high speed racing.

The tyre of Figure 1 comprises a pair of sidewalls 7 and 8 terminating in bead regions 9 and 10. Each bead region is reinforced by an inextensible annular bead core 11 and 12. Extending between each bead region is a tyre carcass reinforcement ply 13 which is anchored in each bead region by being turned around the respective bead core 11,12 laterally from the inside to the outside to form a ply turn-up 17. The carcass reinforcement ply 13 comprises one ply of tyre fabric comprising rubber covered nylon cords of 2/94 TEX laid with the cords at between 50° and 90° to the tyre circumferential direction. Whilst the embodiment here comprises one carcass ply it may comprise multiple plies.

The tyre has a camber value of 0.6 and comprises a convex tread region 1, having tread edges 2,3 reinforced by a breaker assembly 4. The breaker assembly comprises two breaker plies each of which comprises Kevlar (Registered Trade Mark) aramid cord tyre fabric each of 2/165 TEX. The cords in each of the breaker plies are oppositely inclined to each other at an angle of between 18°-30° and preferably 25° to the circumferential direction of the tyre. The radially inner breaker ply is narrower than the radially outer breaker ply.

Radially inside and immediately adjacent to the two breaker plies of the breaker 4 is a secondary carcass ply 5 comprising rubber covered nylon cords of 2/94 TEX. The cords of the secondary carcass ply 5 are laid at an angle between 50° and 90° to the circumferential direction of the tyre and cross, i.e. are oppositely inclined to, the cords of the carcass ply 13. The secondary carcass ply 5 extends from the tread into each bead region 9,10 to overlap the turn-up portion 17 of the carcass ply.

Both the carcass ply 13 and the secondary carcass ply 5 have a rubber covering of 0.09mm thickness over the nylon reinforcing cords.

Disposed between the carcass ply 13 and the secondary carcass ply 5 is a rubber member 6 comprising cured rubber of hardness 65 Shore measured at 21°C. The rubber member 6 extends from the tread to the bead region to about the bead cores 11 and 12, and is of a

substantially constant thickness of 0.65mm throughout its width. It is to be noted that the tyre has no tapered rubber apex member incorporated in the bead region.

The resultant tyres have been found to not only have improved cornering power, damping and grip but also to be stable and effectively resist collapse under severe braking.

Claims

1. A motorcycle tyre comprising a tread (1) reinforced between its edges (2,3) by a breaker assembly (4) and having in its normally inflated fitted condition a camber value C/L of between 0.5 and 0.7, a reinforcing carcass ply (13) of rubber covered cords radially inside the breaker assembly and extending between two bead regions (9,10) and wrapped in each bead region around an annular bead core (11,12) to form carcass ply turn-ups (17) and between the tread edges (2,3) and bead regions (9,10), tyre sidewalls (7,8) characterised in that under the tread (1) is disposed radially inward of the breaker assembly (4) a secondary carcass ply (5) of rubber covered cords and between the carcass ply (13) and the secondary carcass ply (5) is disposed a rubber member (6) extending from tread edge (2,3) to tread edge (2,3).

2. A motorcycle tyre according to claim 1, characterised in that the rubber member (6) continues from the tread edge (2,3) to the respective bead region (9,10).

3. A motorcycle tyre according to either of claims 1 or 2, characterised in that the secondary carcass ply (5) extends from the tread (1) to each bead region (9,10).

4. A motorcycle tyre according to claim 3, characterised in that the secondary carcass ply (5) overlaps the carcass ply turn-ups (17) in each bead region (9,10).

5. A motorcycle tyre according to any of claims 1 to 4, characterised in that the cords of the carcass ply (13) are disposed at an angle of between 50° and 90° to the circumferential direction of the tyre.

6. A motorcycle tyre according to any of claims 1 to 5, characterised in that the cords of the secondary carcass ply (5) are disposed at an angle of between 50° and 90° to the circumferential direction of the tyre.

7. A motorcycle tyre according to any of claims 1 to 6, characterised in that the carcass ply comprises organic fibre cords.

8. A motorcycle tyre according to any of claims 1 to 7, characterised in that the secondary carcass ply comprises organic fibre cords.

9. A motorcycle tyre according to claim 7, characterised in that the carcass ply comprises nylon cords.

10. A motorcycle tyre according to claim 8, characterised in that the secondary carcass ply comprises nylon cords.

11. A motorcycle tyre according to any of claims 2 to 10, characterised in that the rubber member extends from the bead core (11,12) in each bead region (9,10).

12. A motorcycle tyre according to any of claims 1 to 11, characterised in that the rubber member (6) has a hardness in the range 55-75 Shore A at 21°C.

13. A motorcycle tyre according to any of claims 1 to 12, characterised in that the cross-sectional thickness of the rubber member (6) is between 0.4 and 1.6mm.

Fig.1.